What is claimed:

1. A disk drive system for improving servo demodulation robustness, comprising:

a read channel to read a servo wedge and produce a servo signal therefrom;

an amplitude measuring circuit to measure an amplitude of the servo signal;

a summer to produce an error signal representing a difference between the measured amplitude and a target amplitude;

a filter to filter the error signal and produce a servo automatic gain control (AGC) signal therefrom; and

a programable limiter to keep the servo AGC signal within a desired range, before the servo AGC signal is used for feedback control.

2. The disk drive system of claim 1, wherein the programable limiter limits an output of the filter to thereby keep the servo AGC signal within a desired range, before the servo AGC signal is provided to a variable gain amplifier (VGA) of the read channel.

3. The system of claim 1, wherein the disk drive system includes a plurality of heads, and wherein the desired range is dependent at least in part on which head is being used to read a servo wedge.

4. The system of claim 1, wherein the disk drive system includes a zone bit recorded disk including a plurality of zones, and wherein the desired range is dependent at least in part on which zone is being read.

5. The system of claim 1, wherein the desired range is dependent at least in part on:

which head, of a plurality of heads, is being used to read the servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

6. The system of claim 1, wherein the filter includes an integration path that includes a further programable limiter that is used to prevent integral windup.

7. The system of claim 1, wherein the programable limiter includes:

a first register that stores an upper limit value;

a second register that stores a lower limit value;

a first comparator to compare the upper limit value to an AGC value output from the filter;

a second comparator to compare the lower limit value to the AGC value output from the filter; and

a multiplexer to output one of the AGC value output from the filter, the upper limit value stored in the first register, and the lower limit value stored in the second register, wherein the multiplexor selects which value to output based on outputs from the first and second comparators.

8. The system of claim 7, further comprising a microprocessor adapted to set the upper limit value stored in the first register and the lower limit value stored in the second register based at least in part on at least one of the following:

which head, of a plurality of heads, is being used to read the servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

9. The system of claim 1, wherein the programmable limiter is adapted to:

compare each servo automatic gain control (AGC) value, of the servo AGC signal, to an upper limit and a lower limit; and

to limit the servo AGC value to the upper limit if the servo AGC value is above the upper limit, and to limit the servo AGC value to the lower limit if the servo AGC value is below the lower limit.

10. The system of claim 9, further comprising a microprocessor adapted to set the upper limit and the lower limit based at least in part on at least one of the following:

which head, of a plurality of heads, is being used to read the servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

11. The system of claim 1, wherein the programmable limiter is within the filter.

12. The system of claim 1, wherein the programmable limiter is external to the filter.

13. A disk drive system for improving servo demodulation robustness, comprising:

a filter to filter an amplitude error signal and produce a servo automatic gain control (AGC) signal therefrom; and

a programmable limiter to keep the servo AGC signal within a desired range, before the servo AGC signal is used for feedback control.

14. The disk drive system of claim 13, wherein the programmable limiter limits an output of the filter to thereby keep the servo AGC signal within a desired range, before the servo AGC signal is provided to a variable gain amplifier (VGA) of a read channel.

15. The system of claim 14, wherein the programmable limiter is within the filter.

16. The system of claim 14, wherein the programmable limiter is external to the filter.

17. A disk drive system, comprising:

a head disk assembly including:

a disk having servo wedges and data fields; and

at least one head to read the servo wedges and data fields and to produce a signal representative of information stored in the servo wedges and data fields; and

a path to condition the signal produced by the at least one head and to produce a conditioned signal therefrom, the path including a variable gain amplifier (VGA);

a servo demodulator including a servo automatic gain controller to adjust an amplitude of the conditioned signal by providing servo automatic gain control (AGC) values to the VGA; and

a programmable limiter to keep the servo AGC values within a desired range.

18. The system of claim 17, wherein the desired range includes an upper limit value and a lower limit value.

19. A disk drive system for improving servo demodulation robustness, comprising:

a read channel to read a servo wedge and produce a servo signal therefrom;

a phase measuring circuit to measure a phase of the servo signal;

a summer to produce an error signal representing a difference between the measured phase and a target phase;

a filter to filter the error signal and produce a servo phase lock loop (PLL) signal therefrom; and

a programmable limiter to keep the servo PLL signal within a desired range, before the servo PLL signal is used to adjust a frequency of an oscillator.

20. The disk drive system of claim 19, wherein the programmable limiter limits an output of the filter to thereby keep the servo PLL signal within the desired range.

21. The system of claim 19, wherein the disk drive system includes a plurality of heads, and wherein the desired range is dependent at least in part on which head is being used to read a servo wedge.

22. The system of claim 19, wherein the disk drive system includes a zone bit recorded disk including a plurality of zones, and wherein the desired range is dependent at least in part on which zone is being read.

23. The system of claim 19, wherein the desired range is dependent at least in part on:

which head, of a plurality of heads, is being used to read the servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

24. The system of claim 19, wherein the filter includes an integration path that includes a further programmable limiter that is used to prevent integral windup.

25. The system of claim 19, wherein the programmable limiter includes:

a first register that stores an upper limit value;

a second register that stored a lower limit value;

a first comparator to compare the upper limit value to a PLL value output from the filter;

a second comparator to compare the lower limit value to the PLL value output from the filter; and

a multiplexer to output one of the PLL value output from the filter, the upper limit value stored in the first register, and the lower limit value stored in the second register, wherein the multiplexor selects which value to output based on outputs from the first and second comparators.

26. The system of claim 25, further comprising a microprocessor adapted to set the upper limit value stored in the first register and the lower limit value stored in the second register based at least in part on at least one of the following:

which head, of a plurality of heads, is being used to read the servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

27. The system of claim 19, wherein the programmable limiter is adapted to:

compare each servo PLL value, of the servo PLL signal, to an upper limit and a lower limit; and

to limit the servo PLL value to the upper limit if the servo PLL value is above the upper limit, and

to limit the servo PLL value to the lower limit if the servo PLL value is below the lower limit.

28. The system of claim 27, further comprising a microprocessor adapted to set the upper limit and the lower limit based at least in part on at least one of the following:

which head, of a plurality of heads, is being used to read the servo wedge; and

which zone, of a plurality of zones, the servo wedge is within.

29. The system of claim 19, wherein the programmable limiter is within the filter.

30. The system of claim 19, wherein the programmable limiter is external to the filter.

31. A disk drive system for improving servo demodulation robustness, comprising:

a filter to filter an amplitude error signal and produce a servo phase lock loop (PLL) signal therefrom; and

a programmable limiter to keep the servo PLL signal within a desired range, before the servo PLL signal is used to adjust an oscillator.

32. The disk drive system of claim 31, wherein the programmable limiter limits an output of the filter to thereby keep the servo PLL signal within a desired range.

33. The system of claim 32, wherein the programmable limiter is within the filter.

34. The system of claim 32, wherein the programmable limiter is external to the filter.

35. A disk drive system, comprising:

a head disk assembly including:

a disk having servo wedges and data fields; and

at least one head to read the servo wedges and data fields and to produce a signal representative of information stored in the servo wedges and data fields; and

a path to condition the signal produced by the at least one head and to produce a conditioned signal therefrom;

a servo demodulator including a servo phase lock loop used to control timing within the path, the servo phase lock loop including an oscillator; and

a programmable limiter to keep servo PLL values produced by the servo phase lock loop within a desired range,

wherein the servo PLL values are used to adjust a frequency of the oscillator.

36. The system of claim 35, wherein the desired range includes an upper limit value and a lower limit value.

37. A disk drive system, comprising:

a head disk assembly including:

a disk having servo wedges and data fields; and

at least one head to read the servo wedges and data fields and to produce a signal representative of information stored in the servo wedges and data fields; and

a path to condition the signal produced by the at least one head and to produce a conditioned signal therefrom;

a servo demodulator including a servo automatic gain controller to adjust an amplitude of the conditioned signal;

a register to store an automatic gain control (AGC) value for the servo automatic gain controller; and

a microprocessor to replace the AGC value stored in the register with a value within a desired range, when the AGC value stored in the register is outside the desired range.

38. The system of claim 37, wherein the microprocessor uses the stored servo AGC value as, or to predict, a starting servo AGC value for use by the servo automatic gain controller when the at least one head begins to read a next servo wedge.

39. The system of claim 38, wherein the desired range includes an upper limit value and a lower limit value, and wherein the microprocessor replaces the servo AGC value stored in the register with the upper limit value when the servo AGC value is above the upper limit value, and wherein the microprocessor replaces the servo AGC value stored in the register with the lower limit value when the servo AGC value is below the lower limit value.

40. The system of claim 39, wherein the disk drive system includes a plurality of heads, and wherein the microprocessor selects the upper limit value and the lower limit value based at least in part on which head is being used to read a servo wedge.

41. The system of claim 39, wherein the disk includes a plurality of zones, and wherein the microprocessor selects the upper limit value and the lower limit value based at least in part on which zone is being read.

42. The system of claim 39, wherein the microprocessor selects the upper limit value and the lower limit value based at least in part on which head, of a plurality of heads, is being used to read a servo wedge, and on which zone, of a plurality of zones, the servo wedge is within.

43. A disk drive system, comprising:

a head disk assembly including:

a disk having servo wedges and data fields; and

at least one head to read the servo wedges and data fields and to produce a signal representative of information stored in the servo wedges and data fields; and

a path to condition the signal produced by the at least one head and to produce a conditioned signal therefrom;

a servo demodulator including a servo phase lock loop used to control timing within the path; and

a register for storing a servo phase lock loop (PLL) value for the servo phase lock loop; and

a microprocessor to replace the servo PLL value stored in the register with a value within a desired range, when the PLL value stored in the register is outside the desired range.

44. The system of claim 43, wherein the microprocessor uses the stored servo PLL value as, or to predict, a starting servo PLL value for use by the servo phase lock loop when the at least one head begins to read a next servo wedge.

45. The system of claim 44, wherein the desired range includes an upper limit value and a lower limit value, and wherein the microprocessor replaces the servo PLL value stored in the register with the upper limit value when the servo PLL value is above the upper limit value, and wherein the microprocessor replaces the servo PLL value stored in the register with the lower limit value when the servo PLL value is below the lower limit value.

46. The system of claim 45, wherein the disk drive system includes a plurality of heads, and wherein the microprocessor selects the upper limit value and the lower limit value based at least in part on which head is being used to read a servo wedge.

47. The system of claim 45, wherein the disk includes a plurality of zones, and wherein the microprocessor selects the upper limit value and the lower limit value based at least in part on which zone is being read.

48. The system of claim 45, wherein the microprocessor selects the upper limit value and the lower limit value based at least in part on which head, of a plurality of heads, is being used to read a servo wedge, and on which zone, of a plurality of zones, the servo wedge is within.